THE UNIVERSITY OF ALBERTA

AN APPRAISAL OF FOURTEEN MUTUAL FUNDS

by

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ABSTRACT

This study is based on the premise that some factors are more important than others in the evaluation of mutual funds. The factors are expenses, performance, size, commission charges, risk-return, and objectives. Their relative importance is determined by testing null hypotheses based on an objective sample of fourteen balanced and fully managed funds, for the period 1957 to 1966, inclusive.

Chapter I outlines the basic methodology for the selection of the mutual funds and the measurement of performance and risk. Chapter II concentrates on expenses, performance, size, and commission charges. Null hypotheses are tested for each of these factors and the results are analyzed. Chapter III focuses on risk, return, and objectives. The risk-return efficiencies for the mutual funds are ranked relative to each other and then compared with their objectives as either balanced or fully managed funds. Chapter IV summarizes the findings of this study and states which factors are relatively more important in the evaluation of mutual funds.

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CHAPTER I

BASIC METHODOLOGY

I SELECTION OF THE MUTUAL FUNDS

Fourteen mutual funds were selected for analysis from the Financial Post Survey of Investment Funds which were categorized as either balanced funds or fully managed funds.

Balanced funds may be generally defined as funds invested in a portfolio of common stock securities and fixed-income securities in a proportion which is deemed to balance the investment risks associated with both types of securities. If risk is measured in terms of the market price volatility for common stocks and for fixed-income securities, the total return on an investment in common stocks is generally more volatile and less predictable than the total return on an investment in fixed-income securities. Total return is defined as the net realized and unrealized capital gains (or losses) plus cash dividends and interest. In terms of portfolio diversification, the manager of a balanced fund decides what proportion of the total portfolio will be invested in common stocks and in fixed-income securities so that the total potential return on the portfolio will be increased significantly with little or no increase in the risk. In this sense, the investment risks associated with both types of securities are "balanced". When the common stocks in the portfolio for the balanced fund increase (decrease) in market value, the total return on the portfolio will in-increase (decrease), to the extent of the investment in common stocks, ceteris paribus. If another fund is invested only in a portfolio of

the same common stocks which increase (decrease) in market value, the total return on that portfolio will increase (decrease) relatively more than for the balanced fund because the portfolio risk is less diversified.

Fully managed funds may be generally defined as funds invested in a portfolio of common stock securities, or fixed-income securities, or some combination of both types of securities, depending on the perceived economic and stock market conditions. If the manager of a fully managed fund concludes that the interest rate level will decline significantly in the next three to four months, he may decide to invest the entire portfolio in bonds on the expectation that bond prices will increase significantly, ceteris paribus. If this expectation becomes a reality, the manager may decide to realize the gains by liquidating all the bonds and to invest the proceeds in common stocks only. In this example, the portfolio risk is concentrated rather than being diversified like a balanced fund. Generally speaking, the risk and return is expected to be greater for the fully managed funds than for the balanced funds because the portfolio risk is less diversified.

The fourteen mutual funds selected from the Financial Post Survey of Investment Funds satisfy the following criteria:

(1) The funds were operational during the period 1957 to 1966, inclusive.

(2) Most of the information was available for purposes of analysis.

With respect to the first criterion, a period of at least ten years is required for any meaningful analysis, and the period selected

should be one where the performance behavior in the first year is similar to that for the last year. The years 1957 and 1966 were selected because the major stock market indices and the performance of most mutual funds had declined significantly on a relative basis in each of those years.

In accordance with the second criterion, most of the information was available for only fourteen mutual funds which were categorized in the Financial Post Survey of Investment Funds as either balanced funds or fully managed funds.

One of the specialty funds, Canafund Company Limited, satisfied both criteria but it was excluded from this analysis because any conclusions might not be valid for any other specialty funds.

The method used to select the fourteen mutual funds was not a random process. It was an objective process necessitated by the temporal and informational requirements for a meaningful analysis.

The following fourteen mutual funds were selected:

Balanced Funds

Champion Mutual Fund of Canada Ltd.

Commonwealth International Leverage Fund Ltd.

Corporate Investors Limited

Fonds Collectif "A"

Investors Mutual of Canada Ltd.

Savings and Investment Corporation Mutual Fund of Canada Ltd.

Timed Investment Fund Limited

Fully Managed Funds

Associate Investors Limited

Beaubran Corporation

Canadian Investment Fund Ltd.

Dominion Equity Investments Ltd.

Grouped Income Shares Ltd.

Mutual Accumulating Fund

Templeton Growth Fund Ltd.

Factors considered in the analysis of these mutual funds include expenses, commission charges, size, risk, performance and objectives.

II EXPENSES, BROKERAGE AND COMMISSION CHARGES

Expenses are defined as cash outlays by the mutual funds for purchased services, but exclude any cash outlays for income taxes, brokerage and commission charges.

Income taxes were excluded so that the expenses of the fourteen mutual funds would be comparable. Some of the unincorporated funds are trusts which do not pay income taxes, while most of the incorporated funds do pay them.

Brokerage commission costs are usually not reported as expenses by the mutual funds because these costs are directly associated with the investment of funds.

The commission payable to salesmen on the purchase of mutual fund shares is usually considered by the mutual funds as a cash outlay or expense incurred by the purchaser and not by the mutual funds.

For purposes of comparison and analysis, annual expenses were expressed as a percentage of the yearly average net assets for each of the fourteen mutual funds for the period 1957 to 1966, inclusive.

III PERFORMANCE

The following method was used to measure the annual performance of the mutual funds:

$$A.P. = \frac{N.A.V.\ (YE) + C.D. - N.A.V.\ (BOY)}{N.A.V.\ (BOY)} \times 100$$

Where: A.P. = percentage annual performance

N.A.V. (YE) = net asset value per share at year end.

C.D. = total cash distributions per share to the nearest low cent during the year.

N.A.V. (BOY) = net asset value per share at the beginning of the year.

To measure the cumulative performance of the mutual funds for the period 1957 to 1966, inclusive, the following method was used:

$$C.P. = (1+A.P._1) \times (1+A.P._2) \times (1+A.P._3) \times \ldots \times (1+A.P._{10}) - 1$$

Where: C.P. = percentage cumulative performance for the period 1957 to 1966, inclusive.

Chain multiplication of the percentage annual performance figures for the mutual funds for the period 1957 to 1966, inclusive, in effect reinvests the total annual cash distributions at the beginning of the next year.

Two computations were made for each of the mutual funds; both of them assumed that the only purchase of mutual fund shares was on January 1, 1957 and that no cash was withdrawn during the period 1957 to 1966, inclusive. The first computation did not allow for the effect of commission charges at the time of purchase on the annual and cumulative performance for each of the mutual funds. Results of this computation were used for the analysis of risk and return. The second computation did allow for the effect of commission charges at the time of

purchase on the cumulative performance for each of the mutual funds. Results of this computation were used to assess the "investor experience" for each fund and also to see if the payment of commission charges was rewarded by better performance.

One limitation of the methodology used to measure the performance of the mutual funds may be the exclusion of the possible effect of the rates of portfolio turnover on performance. However, the authors of one extensive study stated that their "...analysis revealed no strong relationship between turnover rates and performance, either when the variables were examined for the same time period or when performance lagged one year behind turnover."[1]

Another limitation of the methodology used for measuring the performance of the mutual funds may be the possible effect of the net cash inflows or outflows on performance. For example, net cash inflows may be invested by one mutual fund in stocks appreciating significantly in value in a relatively favorable market environment, while net cash inflows may be invested by another mutual fund in a less propitious market environment. The timing of the net cash inflows or outflows may have a significant effect on the performance of each of the mutual funds.

The results of the methodology used to measure performance should closely approximate the actual performance of the mutual funds, provided the portfolio turnover rates and the net cash inflows or outflows are not significant for any of the funds.

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[1]Irwin Friend, F.E. Brown, Edward S. Herman and Douglas Vickers, A Study of Mutual Funds, (Washington: U.S. Government Printing Office, 1962), p. 19.

IV RISK AND RETURN

Most of the present theory assumes there is a positive association between risk and return. Attempts have been made by some empiricists to develop a methodology for measuring risk and return. The methodology for measuring return has developed more quickly than for risk because it is more easily defined. In this study, risk is defined as the degree of volatility in the cumulative return for each of the fourteen mutual funds over a period of ten years, relative to each other, and relative to an assumed non-chequing savings account which has the least volatile cumulative return. Volatility is measured by the standard deviation of the cumulative return and also by the slope of the straight line of regression for the cumulative return of each mutual fund and of the savings account. The greater the standard deviation or the steeper the slope of the straight line of regression, the greater the risk and performance.

This definition of risk assumes that all the different types of risk associated with all the investments in the portfolio for a mutual fund have been measured by the market. The net result is expressed in the cumulative return for the mutual fund. Some of the different types of risk may include financial risk, interest rate risk, purchasing power risk, and the marketability risk, in varying degrees depending on the types of investments. It may be argued that the market measurement of risk is not an accurate one because the market does not operate on the basis of complete information and therefore it cannot properly measure all risks at any given point in time. Nevertheless, the market does attempt to measure the perceived risk on the basis of partial information at a given point in time, and over the long-term the measurement

may be reasonably accurate as more information becomes available. The market measure of risk can be quantified in spite of its limitations.

Some attempts have been made to measure the performance of mutual funds relative to recognized stock market indices such as the Dow Jones Industrial Average or Standard and Poor's Composite Index. However, using these indices as yardsticks for measuring the performance of mutual funds assumes comparability between the weighted constituents of the indices and the mutual funds, which is usually not the case. Most of the recognized stock market indices are not actually representative of the stock market and hence they are not meaningful measurements of market behavior. In addition, the use of stock market indices as yardsticks emphasizes performance rather than risk and performance. Therefore, a more meaningful and comparable yardstick should emphasize minimal or maximal risk and performance. The following measure emphasizes minimal risk and performance:

> An assumed non-chequing savings account with the Federal Government paying interest at an annual rate equal to the market rate for the Government of Canada Bonds, 3 3/4% due January 15, 1975-78, on the last Wednesday of each year, based on the account balance at the beginning of each year, during the period 1957 to 1966, inclusive. It is also assumed that the principal amount deposited in the account at the beginning of 1957 remains constant and that the annual interest credited to the account is not withdrawn during the period.

This savings account has the least volatile cumulative return relative to the fourteen mutual funds in this study and for this reason it emphasizes minimal risk and performance or return. To assess risk and return, the equations for the straight lines of regression were computed for the cumulative returns of each of the fourteen mutual funds relative to the cumulative return of the savings account. The slope of each regression line indicates the cumulative return of each mutual fund relative to the cumulative return of the savings account; the steeper the slope, the greater the risk and return. The rest of the methodology, which is similar in some respects to that promulgated by Treynor[2], is exemplified by using the following assumed information:

$Y = 5 + 2X$

SA = 61.23%

ACR = 103.45%

ECR = SR X SA

RR = ACR/ECR

Where: Y = equation for the straight line of regression.

SA = cumulative return of the non-chequing savings account.

ACR = actual cumulative return of the mutual fund.

ECR = expected cumulative return of the mutual fund.

SR = slope of the straight line of regression.

RR = risk-return efficiency.

Therefore:

ECR = (2) x (61.23) = 122.46%

RR = 103.45/122.46 = 84.47%

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[2]Jack L. Treynor, "How to Rate Management of Investment Funds," Harvard Business Review, (January-February, 1965), pp. 63-75.

In this example, the mutual fund in question was able to earn 84.5% of the amount expected on the basis of the actual risk exposure.

Risk and return are also measured in terms of the risk factor for each of the mutual funds. The risk factor for a mutual fund is simply the actual cumulative return divided by its standard deviation which is an indication of the risk-return efficiency. A mutual fund with the highest risk factor means that it is the most efficient in the utilization of risk relative to the other funds. With this method, there is no attempt to determine the expected cumulative return for a mutual fund on the basis of its actual risk exposure in order to compute its risk-return efficiency.

CHAPTER II

EXPENSES, PERFORMANCE, SIZE, AND COMMISSION CHARGES

On the basis of the fourteen mutual funds, null hypotheses were tested at the 0.05 level of significance to determine the general relevance of such variables as expenses, performance, size, and commission charges in the evaluation of mutual funds.

I EXPENSES

Null hypotheses were formulated to test the significance of the strength of the possible relationships between the variable of expenses and the variables of performance and size, as indicated by the partial and multiple coefficients of correlation.

The null hypothesis of no correlation between expenses and annual performance, when the total net assets are held constant, is rejected for two mutual funds; it is accepted for eleven funds, while judgment is reserved on the remaining fund. (Table IV). In the case of the two mutual funds where the null hypothesis is rejected, the relationship between expenses and annual performance is positive. In other words, the expenses increased as the annual performance increased.

When the total net assets are held constant, the null hypothesis of no correlation between expenses and cumulative performance is rejected for one mutual fund; it is accepted for twelve funds, while judgment is reserved on the remaining fund (Table V).

It is apparent, on the basis of the mean and median coefficients of correlation for the fourteen mutual funds, that there is no relationship between expenses and annual performance, or between expenses and

TABLE I

FOURTEEN MUTUAL FUNDS

EXPENSES AS A PERCENTAGE OF AVERAGE NET ASSETS

FOR THE PERIOD 1957 to 1966, INCLUSIVE *

FUNDS	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Balanced Funds										
Champion Mutual Fund	0.484%	0.371%	0.485%	0.692%	0.813%	1.265%	1.104%	0.921%	1.250%	1.419%
Commonwealth International Leverage Fund	1.295	2.614	2.311	2.324	1.386	1.036	1.104	0.820	0.719	1.101
Corporate Investors	0.552	0.572	0.774	0.631	0.521	0.633	0.517	0.588	0.567	0.600
Fonds Collectif "A"	Not available	0.926	0.931	1.000	0.974	0.942	0.892	0.909	0.757	0.760
Investors Mutual	0.568	0.550	0.574	0.552	0.556	0.531	0.538	0.536	0.513	0.525
Savings & Investment Corporation	0.279	0.384	0.692	0.657	0.592	0.650	0.618	0.626	0.609	0.612
Timed Investment Fund	0.998	0.886	0.895	0.898	0.933	0.923	0.929	0.892	0.921	1.000
Fully Managed Funds										
Associate Investors	1.153%	0.901%	0.866%	0.932%	0.855%	0.916%	0.854%	0.733%	0.782%	0.718%
Beaubran Corporation	0.239	0.503	0.462	0.472	0.436	0.435	0.446	0.448	0.440	0.444
Canadian Investment Fund	0.510	0.510	0.480	0.480	0.460	0.470	0.450	0.450	0.440	0.460
Dominion Equity Investments	0.623	0.666	0.661	0.640	0.638	0.617	0.633	0.600	0.632	0.639
Grouped Income Shares	0.720	0.788	0.511	0.607	0.695	0.690	0.691	0.659	0.772	0.729
Mutual Accumulating Fund	0.325	0.405	0.400	0.386	0.416	0.396	0.412	0.389	0.394	0.390
Templeton Growth Fund	0.750	1.260	0.990	0.990	0.900	0.880	1.040	1.620	1.023	1.010

* Excluding provision for income taxes, brokerage commissions, and acquisition commissions

Source: Financial Post Survey of Investment Funds.

TABLE II

FOURTEEN MUTUAL FUNDS

ANNUAL AND CUMULATIVE PERFORMANCE ASSUMING REINVESTMENT
OF ALL CASH DISTRIBUTIONS FOR THE PERIOD
1957 to 1966, INCLUSIVE

FUNDS	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1957-1966
Balanced Funds											
Champion Mutual Fund	-11.56%	+26.39%	+3.11%	+2.21%	+20.11%	-7.82%	+14.05%	+18.24%	+5.68%	-10.76%	+65.80%
Commonwealth International Leverage Fund	-20.73	+55.07	+9.45	+1.19	+28.09	-12.50	+13.90	+18.99	+10.33	- 9.73	+105.90
Corporate Investors	-11.22	+28.29	+2.43	+4.26	+20.53	-1.91	+11.04	+13.83	+1.86	-5.51	+74.88
Fonds Collectif "A"	- 1.80	+14.58	+2.81	+2.82	+24.62	-2.35	+12.00	+14.67	+1.62	-6.76	+76.09
Investors Mutual	- 8.61	+27.85	+3.77	+4.54	+20.58	-5.62	+11.02	+15.22	+5.87	-5.51	+84.54
Savings & Investment Corporation	- 5.20	+18.88	+0.93	+1.91	+27.18	-5.20	+11.29	+16.40	+3.59	-6.74	+74.85
Timed Investment Fund	- 5.66	+34.15	-0.18	+5.63	+20.00	+0.15	+7.47	+16.06	+2.11	-8.78	+86.27
Fully Managed Funds											
Associate Investors	- 7.80%	+28.44%	+7.92%	-5.24%	+25.45%	-1.09%	+15.06%	+23.45%	+4.46%	-10.36%	+99.80%
Beaubran Corporation	- 8.59	+20.45	+0.70	+4.31	+23.37	-2.07	+12.98	+20.55	+3.62	-7.64	+82.07
Canadian Investment Fund	- 9.67	+23.16	+1.94	+1.65	+26.10	-2.51	+12.16	+18.35	+3.34	-7.92	+78.97
Dominion Equity Investments	- 7.89	+23.17	+4.53	+3.95	+25.98	-0.22	+15.07	+18.01	+5.84	-6.83	+107.44
Grouped Income Shares	-15.55	+31.37	+5.75	-6.83	+20.00	-6.03	+17.05	+16.40	+7.65	-13.82	+55.75
Mutual Accumulating Fund	-12.02	+25.55	+4.21	+1.01	+24.66	-6.42	+16.57	+18.87	+7.01	-4.24	+92.52
Templeton Growth Fund	-17.23	+49.04	+14.38	+14.19	+17.77	-13.52	+5.13	+28.41	+21.97	-5.20	+156.08
Non-Chequing Savings Account *	+ 3.80%	+4.76%	+5.60%	+5.41%	+4.96%	+5.03%	+5.16%	+5.06%	+5.53%	+5.91%	+64.77%

* Assumes a non-chequing savings account with the Federal Government, which has paid interest at an annual rate equal to the market rate for the Government of Canada Bonds, 3 3/4%, due January 15, 1975-78, on the last Wednesday of each year, based on the account balance at the beginning of each year, during the period 1957 to 1966, inclusive. It is also assumed that the principal amount deposited in the account at the beginning of 1957 remains constant and that the annual interest credited to the account is not withdrawn during the period.

Source: Financial Post Survey of Investment Funds.

TABLE III

FOURTEEN MUTUAL FUNDS

TOTAL NET ASSETS FOR THE PERIOD

1957 to 1966, INCLUSIVE

FUNDS	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Balanced Funds										
Champion Mutual Fund	$ 247,327	$ 511,523	$ 600,085	$ 1,071,921	$ 1,479,982	$ 1,669,208	$ 1,986,098	$ 2,478,256	$ 3,707,894	$ 4,134,939
Commonwealth International Leverage Fund	2,562,312	1,628,274	2,934,948	4,507,732	8,453,938	10,553,600	12,231,503	16,092,092	24,200,852	24,798,654
Corporate Investors	6,886,661	8,920,262	9,384,758	9,767,916	11,687,532	11,674,012	12,599,910	15,785,200	18,657,459	17,466,945
Fonds Collectif "A"	635,110	1,530,164	2,922,889	3,430,199	5,811,679	10,229,943	15,558,039	24,926,316	33,574,443	29,331,458
Investors Mutual	126,437,585	170,465,857	198,467,381	218,416,873	298,019,086	318,996,943	381,924,306	496,312,102	571,222,814	560,450,336
Savings & Investment Corporation	439,672	1,579,637	3,839,985	5,118,229	9,853,434	13,758,850	18,580,020	25,267,978	34,748,097	36,763,982
Timed Investment Fund	1,407,303	1,847,377	1,853,879	1,996,200	2,231,348	2,196,438	2,318,363	2,817,293	2,859,037	2,447,978
Fully Managed Funds										
Associate Investors	570,496	755,437	890,979	819,333	1,024,748	970,161	1,173,733	1,452,097	1,604,336	1,475,413
Beaubran Corporation	13,347,000	14,981,400	14,542,000	14,556,000	16,835,000	15,649,189	17,189,082	19,837,110	19,825,308	17,768,300
Canadian Investment Fund	83,821,628	120,195,297	126,632,665	127,466,674	151,207,107	145,705,604	159,623,892	187,201,425	190,056,136	169,036,091
Dominion Equity Investments	8,342,337	7,642,484	9,236,864	8,231,550	9,006,153	9,495,366	10,754,892	11,845,257	12,050,755	10,650,858
Grouped Income Shares	4,572,649	7,464,054	8,983,380	9,776,964	15,292,574	16,567,628	20,442,828	22,761,991	27,025,873	24,242,574
Mutual Accumulating Fund	13,433,107	18,366,635	24,298,285	26,063,491	38,685,021	43,874,552	51,945,202	62,525,346	67,916,271	64,673,104
Templeton Growth Fund	2,840,091	3,673,141	4,596,369	5,565,138	6,502,459	5,382,141	3,297,252	4,239,378	4,731,691	5,039,945

Source: Financial Post Survey Funds

TABLE IV

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	-0.3988	-0.6533		x	
Commonwealth International Leverage Fund	0.4070	0.6533		x	
Corporate Investors	-0.2971	-0.6533		x	
Fonds Collectif "A" **	0.3953	0.6929		x	
Investors Mutual	0.0134	0.6533		x	
Savings & Investment Corporation	0.0419	0.6533		x	
Timed Investment Fund	-0.6522	-0.6533			x
Fully Managed Funds					
Associate Investors	-0.4829	-0.6533		x	
Beaubran Corporation	0.4428	0.6533		x	
Canadian Investment Fund	-0.1389	-0.6533		x	
Dominion Eqiity Investments	0.1957	0.6533		x	
Grouped Income Shares	0.1702	0.6533		x	
Mutual Accumulating Fund	0.7200	0.6533	x		
Templeton Growth Fund	0.6936	0.6533	x		

*Total Net Assets Constant

**For the Period 1958 to 1966, Inclusive

For the Fourteen Mutual Funds:

(i) Mean Partial Coefficient of Correlation: 0.0792

(ii) Median Partial Coefficient of Correlation: 0.1061

Null Hypothesis: There is no correlation between expenses and annual performance; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if

$$\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}.$$

cumulative performance, when the total net assets are held constant.

The null hypothesis of no correlation between expenses and total net assets, when the annual performance is held constant, is accepted for eight mutual funds, while it is rejected for the remaining six funds (Table VI).

When the cumulative performance is held constant, the null hypothesis of no correlation between expenses and total net assets is accepted for eleven mutual funds, while it is rejected for the remaining three funds (Table VII).

On the basis of the mean and median partial coefficients of correlation for the fourteen mutual funds, there is no relationship between expenses and total net assets, when either the annual or the cumulative performance is held constant.

Null hypotheses were also tested by using the multiple coefficients of correlation. The null hypotheses of no correlation when expenses are dependent on the annual performance and the total net assets is rejected for eight mutual funds; it is accepted for five funds, while judgment is reserved for the remaining fund (Table VIII). Using the mean and median multiple coefficients of correlation for the fourteen mutual funds, expenses are dependent on the annual performance and the total net assets.

The null hypothesis of no correlation when expenses are dependent on the cumulative performance and the total net assets is rejected for seven mutual funds, while it is accepted for the remaining seven funds (Table IX). On the basis of the mean multiple coefficient of correlation for the fourteen mutual funds, expenses are not dependent on the cumulative performance and the total net assets. Judgment is

TABLE V

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	-0.1828	-0.6533		x	
Commonwealth International Leverage Fund	0.2149	0.6533		x	
Corporate Investors	-0.2463	-0.6533		x	
Fonds Collectif "A" **	0.7090	0.6929			x
Investors Mutual	0.1149	0.6533		x	
Savings & Investment Corporation	0.1110	0.6533		x	
Timed Investment Fund	0.6911	0.6533	x		
Fully Managed Funds					
Associate Investors	0.0853	0.6533		x	
Beaubran Corporation	-0.0339	-0.6533		x	
Canadian Investment Fund	-0.0088	-0.6533		x	
Dominion Equity Investments	0.1888	0.6533		x	
Grouped Income Shares	-0.1715	-0.6533		x	
Mutual Accumulating Fund	0.2229	0.6533		x	
Templeton Growth Fund	0.4285	0.6533		x	

* Total Net Assets Constant

** For the Period 1958 to 1966, Inclusive

For the Fourteen Mutual Funds:

(i) Mean Partial Coefficient of Correlation: 0.1516

(ii) Median Partial Coefficient of Correlation: 0.1130

Null Hypothesis: There is no correlation between expenses and cumulative performance; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

TABLE VI

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.8874	0.6533	x		
Commonwealth International Leverage Fund	-0.7496	-0.6533	x		
Corporate Investors	-0.2142	-0.6533		x	
Fonds Collectif "A" **	-0.8584	-0.6929	x		
Investors Mutual	-0.9306	-0.6533	x		
Savings & Investment Corporation	0.4228	0.6533		x	
Timed Investment Fund	-0.2203	-0.6533		x	
Fully Managed Funds					
Associate Investors	-0.8955	-0.6533	x		
Beaubran Corporation	0.1983	0.6533		x	
Canadian Investment Fund	-0.9244	-0.6533	x		
Dominion Equity Investments	-0.5830	-0.6533		x	
Grouped Income Shares	0.2779	0.6533		x	
Mutual Accumulating Fund	0.4116	0.6533		x	
Templeton Growth Fund	-0.2343	-0.6533		x	

* Annual Performance Constant

** For the Period 1958 to 1966, Inclusive

For the Fourteen Mutual Funds:

(i) Mean Partial Coefficient of Correlation: -0.2437

(ii) Median Partial Coefficient of Correlation: -0.2273

Null Hypothesis: There is no correlation between expenses and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$

TABLE VII

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.6942	0.6533	x		
Commonwealth International Leverage Fund	-0.5808	-0.6533		x	
Corporate Investors	0.1865	0.6533		x	
Fonds Collectif "A" **	-0.8736	-0.6929	x		
Investors Mutual	-0.5537	-0.6533		x	
Savings & Investment Corporation	0.0518	0.6533		x	
Timed Investment Fund	-0.7036	-0.6533	x		
Fully Managed Funds					
Associate Investors	-0.2866	-0.6533		x	
Beaubran Corporation	0.1098	0.6533		x	
Canadian Investment Fund	-0.4470	-0.6533		x	
Dominion Equity Investments	-0.4088	-0.6533		x	
Grouped Income Shares	0.2433	0.6533		x	
Mutual Accumulating Fund	-0.1521	-0.6533		x	
Templeton Growth Fund	-0.3335	-0.6533		x	

* Cumulative Performance Constant

** For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:

(i) Mean Partial Coefficient of Correlation: -0.2182

(ii) Median Partial Coefficient of Correlation: -0.4279

Null Hypothesis: There is no correlation between expenses and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

TABLE VIII

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	MULTIPLE COEFFICIENT OF CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.9000	0.6533	x		
Commonwealth International Leverage Fund	0.7992	0.6533	x		
Corporate Investors	0.3461	0.6533		x	
Fonds Collectif "A" *	0.8933	0.6929	x		
Investors Mutual	0.9308	0.6533	x		
Savings & Investment Corporation	0.4233	0.6533		x	
Times Investment Fund	0.6686	0.6533			x
Fully Managed Funds					
Associate Investors	0.9038	0.6533	x		
Beaubran Corporation	0.5317	0.6533		x	
Canadian Investment Fund	0.9298	0.6533	x		
Dominion Equity Investments	0.5993	0.6533		x	
Grouped Income Shares	0.3274	0.6533		x	
Mutual Accumulating Fund	0.7632	0.6533	x		
Templeton Growth Fund	0.7017	0.6533	x		

* For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:
(i) Mean Multiple Coefficient of Correlation: 0.6942
(ii) Median Multiple Coefficient of Correlation: 0.6852

Null Hypothesis: There is no correlation when expenses are dependent on annual performance and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

TABLE IX

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	MULTIPLE COEFFICIENT OF CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.8845	0.6533	x		
Commonwealth International Leverage Fund	0.7662	0.6533	x		
Corporate Investors	0.3049	0.6533		x	
Fonds Collectif "A" *	0.9387	0.6929	x		
Investors Mutual	0.9337	0.6533	x		
Savings & Investment Corporation	0.4346	0.6533		x	
Timed Investment Fund	0.7025	0.6533	x		
Fully Managed Funds					
Associate Investors	0.8741	0.6533	x		
Beaubran Corporation	0.3319	0.6533		x	
Canadian Investment Fund	0.9249	0.6533	x		
Dominion Equity Investments	0.5986	0.6533		x	
Grouped Income Shares	0.3304	0.6533		x	
Mutual Accumulating Fund	0.4209	0.6533		x	
Templeton Growth Fund	0.3187	0.6533		x	

*For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:
(i) Mean Multiple Coefficient of Correlation: 0.5594
(ii) Median Multiple Coefficient of Correlation: 0.6506

Null Hypothesis: There is no correlation when expenses are dependent on cumulative performance and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n.1}}$.

reserved on this relationship when the median multiple coefficient of correlation is used.

To summarize, it is apparent on the basis of the mean and median partial coefficients of correlation for the fourteen mutual funds, that:

A. (1) There is no relationship between expenses and annual performance, or between expenses and cumulative performance, when the total net assets are held constant.

(2) There is no relationship between expenses and total net assets, when either the annual or the cumulative performance is held constant.

On the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds, it is apparent that:

B. (1) Expenses are dependent on the annual performance and the total net assets.

(2) Expenses are not dependent on the cumulative performance and the total net assets when the mean coefficient is used, but judgment is reserved on this relationship when the median coefficient is used.

B(1) is interesting in the light of the partial correlation analysis and of B(2) For each of the fourteen mutual funds in B(1), the multiple coefficients of correlation are positive which indicates that expenses will increase when the annual performance and the total net assets both increase. This finding suggests that management fees represent a significant proportion of the total expenses in view of the fact that the annual management fees for all fourteen mutual funds are a specified percentage of their annual or average annual market value. Consequently, these fees will increase when the annual performance and/or the total net assets increase. However, expenses, including management fees, may or may not be significant in relation to the cumulative performance and the total net assets over the ten year period.

II PERFORMANCE

Null Hypotheses were formulated to test the significance of the strength of possible relationships between the variable of performance and the variables of expenses and size, as indicated by the partial and multiple coefficients of correlation.

On the basis of the mean and median partial coefficients of correlation for the fourteen mutual funds, the null hypothesis of no correlation between the annual performance and the total net assets is accepted, when the expenses are held constant (Table X). However, the null hypothesis of no correlation between the cumulative performance and the total net assets is rejected, when the expenses are held constant (Table XI). The positive correlation between these two variables strongly suggests that the total net assets will increase when the cumulative performance increases. While increases in the net realized and unrealized capital gains on investments will increase the total net assets, it is evident for most of the funds that the increase in total net assets is largely attributable to new and additional contributions by investors (Table III). Investors are influenced considerably by the cumulative performance records of the funds. Of the fourteen mutual funds, Templeton Growth Fund is the only exception with a relatively weak correlation between the cumulative performance and the total net assets. This is probably due to the distribution of its common shares. Prior to 1963,the common shares were offered for sale outside Canada. Since 1963, the common shares have not been offered for sale in the U.S., but they have been offered in Ontario and Quebec. It is apparent that the distribution of the common shares has been restricted somewhat and subject to change. Consequently, Templeton Growth Fund has not exper-

TABLE X

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.2865	0.6533		x	
Commonwealth International Leverage Fund	0.1788	0.6533		x	
Corporate Investors	-0.1255	-0.6533		x	
Fonds Collectif "A" **	0.1768	0.6929		x	
Investors Mutual	-0.0151	-0.6533		x	
Savings & Investment Corporation	-0.1514	-0.6533		x	
Timed Investment Fund	-0.1131	-0.6533		x	
Fully Managed Funds					
Associate Investors	-0.4128	-0.6533		x	
Beaubran Corporation	0.2028	0.6533		x	
Canadian Investment Fund	0.2554	0.6533		x	
Dominion Equity Investments	0.0989	0.6533		x	
Grouped Income Shares	0.0104	0.6533		x	
Mutual Accumulating Fund	-0.2294	-0.6533		x	
Templeton Growth Fund	0.1866	0.6533		x	

* Expenses Constant

** For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:

(i) Mean Partial Coefficient of Correlation: 0.0249

(ii) Median Partial Coefficient of Correlation: -0.0023

Null Hypothesis: There is no correlation between annual performance and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} < r < \frac{1.96}{\sqrt{n-1}}$.

TABLE XI

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR PARTIAL CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	PARTIAL COEFFICIENT OF CORRELATION *	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.7694	0.6533	x		
Commonwealth International Leverage Fund	0.8386	0.6533	x		
Corporate Investors	0.9611	0.6533	x		
Fonds Collectif "A" **	0.9426	0.6929	x		
Investors Mutual of Canada	0.8746	0.6533	x		
Savings & Investment Corporation	0.9292	0.6533	x		
Timed Investment Fund	0.9938	0.6533	x		
Fully Managed Funds					
Associate Investors	0.9733	0.6533	x		
Beaubran Corporation	0.9725	0.6533	x		
Canadian Investment Fund	0.8725	0.6533	x		
Dominion Equity Investments	0.9090	0.6533	x		
Grouped Income Shares	0.9599	0.6533	x		
Mutual Accumulating Fund	0.9822	0.6533	x		
Templeton Growth Fund	0.5100	0.6533		x	

* Expenses Constant

** For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds

(i) Mean Partial Coefficient of Correlation: 0.8921

(ii) Median Partial Coefficient of Correlation: 0.9359

Null Hypothesis: There is no correlation between cumulative performance and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} < r < \frac{1.96}{\sqrt{n-1}}$.

TABLE XII

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	MULTIPLE COEFFICIENT OF CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual	0.4244	0.6533		x	
Commonwealth International Leverage Fund	0.4495	0.6533			x
Corporate Investors	0.3034	0.6533		x	
Fonds Collectif "A" *	0.5066	0.6929		x	
Investors Mutual	0.0768	0.6533		x	
Savings & Investment Corporation	0.1529	0.6533		x	
Timed Investment Fund	0.6529	0.6533			x
Fully Managed Funds					
Associate Investors	0.4848	0.6533		x	
Beaubran Corporation	0.5330	0.6533		x	
Canadian Investment Fund	0.3612	0.6533		x	
Dominion Equity Investments	0.1967	0.6533		x	
Grouped Income Shares	0.1808	0.6533		x	
Mutual Accumulating	0.7238	0.6533	x		
Templeton Growth Fund	0.6939	0.6533	x		

*For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:
(i) Mean Multiple Coefficient of Correlation: 0.4101
(ii) Median Multiple Coefficient of Correlation: 0.4370

Null Hypothesis: There is no correlation when annual performance is dependent on expenses and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

ienced the "normal" increase in total net assets as a result of its relatively superior cumulative performance.

Using multiple coefficients of correlation, the null hypothesis of no correlation when the annual performance is dependent on expenses and total net assets is rejected for two mutual funds, while it is accepted for ten funds (Table XII). Judgment is reserved on the remaining two funds. The null hypothesis is accepted on the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds.

The null hypothesis of no correlation when the cumulative performance is dependent on expenses and the total net assets is rejected for thirteen mutual funds, while it is accepted for the remaining fund (Table XIII). On the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds, the null hypothesis is rejected. Consequently, there is a strong and statistically significant correlation when cumulative performance is dependent on expenses and total net assets. The results of the partial correlation analysis (Table XI) indicates that the cumulative performance is more dependent on total net assets than on expenses. Hence, an increase in the cumulative performance will mean an increase in the total net assets of a mutual fund, largely as a result of new and additional contributions by investors.

To summarize, it is apparent on the basis of the mean and median partial coefficients of correlation for the fourteen mutual funds, that:

(1) There is no relationship between the annual performance and the total net assets, when expenses are held constant.

(2) There is a relationship between the cumulative performance and the total net assets, when expenses are held constant.

TABLE XIII

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	MULTIPLE COEFFICIENT OF CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.9102	0.6533	x		
Commonwealth International Leverage Fund	0.9028	0.6533	x		
Corporate Investors	0.9634	0.6533	x		
Fonds Collectif "A" *	0.9715	0.6929	x		
Investors Mutual	0.9780	0.6533	x		
Savings & Investment Corporation	0.9427	0.6533	x		
Timed Investment Fund	0.9937	0.6533	x		
Fully Managed Funds					
Associate Investors	0.9930	0.6533	x		
Beaubran Corporation	0.9752	0.6533	x		
Canadian Investment Fund	0.9781	0.6533	x		
Dominion Equity Investments	0.9305	0.6533	x		
Grouped Income Shares	0.9620	0.6533	x		
Mutual Accumulating Fund	0.9848	0.6533	x		
Templeton Growth Fund	0.5020	0.6533		x	

* For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:
(i) Mean Multiple Coefficient of Correlation: 0.9277
(ii) Median Multiple Coefficient of Correlation: 0.9675

Null Hypothesis: There is no correlation when cumulative performance is dependent on expenses and total net assets; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

On the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds, it is apparent that:

(1) Annual performance is not dependent on expenses and the total net assets.

(2) Cumulative performance is dependent on expenses and the total net assets.

These results are compared with the findings of an extensive study on mutual funds in the U.S. Part of this study concentrated on purchases of mutual fund shares by investors in relation to the performance records of the funds for a period of five and three-quarter years, between December 31, 1952 to September 30, 1958. Friend et al found that:

> Annual figures, with inflow lagged one year behind performance, do reveal a weak positive pattern among the common stock funds but no relationship among the balanced funds. Cumulative figures for the entire five and three-quarter years show a stronger positive pattern.[1]

The annual cash inflow information is not available for the fourteen mutual funds so that it could be lagged one year behind performance. However, the median partial coefficient of correlation of +0.0809 for the balanced funds and of +0.0547 for the fully managed funds, are positive but they indicate a very weak relationship between the annual performance and the total net assets (Table X). For the purposes of comparison, the mean and median multiple coefficients of correlation of +0.3666 and +0.4370, respectively, for the balanced funds and of +0.4534 and +0.5089, respectively, for the fully managed funds, are positive and they indicate a stronger relationship (Table XII). On the basis of the median partial correlation coefficients, the relationship between the

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[1]Irvin Friend, F. E. Brown, Edward S. Herman and Douglas Vickers, A Study of Mutual Funds, (Washington: U.S. Government Printing Office, 1962), p. 20.

annual performance and the total net assets for the balanced funds is slightly stronger than for the fully managed funds, although the relationship for both types of funds is weak. This conclusion on the basis of annual figures differs from the conclusion of Friend et al. However, the multiple correlation coefficients indicate that the relationship between the annual performance and the total net assets is slightly stronger for the fully managed funds than for the balanced funds, which contradicts the conclusion on the basis of the median partial correlation coefficients and generally supports the conclusion of Friend et al. As the partial and multiple coefficients of correlation between the annual performance and the total net assets are not statistically significant, it is likely that any attempt to reconcile the contradictory conclusions would not be meaningful.

On a cumulative basis, the mean and median partial coefficients of correlation for the relationship between the cumulative performance and the total net assets are +0.9013 and +0.9359, respectively, for the balanced funds, and +0.8828 and +0.9662, respectively, for the fully managed funds (Table XI). The mean and median multiple coefficients of correlation are +0.9518 and +0.9675, respectively, for the balanced funds, and +0.9037 and +0.9767, respectively, for the fully managed funds (Table XIII). On the basis of the more meaningful median coefficients of correlation, the relationship between the cumulative performance and the total net assets is positive and very strong for both types of funds, but it is slightly stronger for the fully managed funds. These results based on the cumulative performance are significantly stronger than the results based on the annual performance, and they generally agree with the findings of Friend et al.

III TOTAL NET ASSETS

In the previous sections dealing with expenses and performance, null hypotheses were tested on the basis of the partial and multiple coefficients of correlation to determine the significance of the relationship between expenses and total net assets, and also between performance and total net assets. Consequently, the results of these tests will not be repeated in this section.

The null hypothesis of no correlation when the total net assets are dependent on expenses and annual performance is accepted for eight mutual funds, while it is rejected for the remaining six funds (Table XIV). On the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds, the null hypothesis is accepted.

The null hypothesis of no correlation when the total net assets are dependent on expenses and the cumulative performance is rejected for thirteen funds, while it is accepted for one fund (Table XV). For the fourteen mutual funds, the null hypothesis is rejected on the basis of the mean and median multiple coefficients of correlation.

To summarize, it is apparent on the basis of the mean and median multiple coefficients of correlation for the fourteen mutual funds, that:

(1) The total net assets are not dependent on expenses and the annual performance.

(2) The total net assets are dependent on expenses and the cumulative performance.

Similar results are obtained in the section dealing with performance when the independent variables are expenses and annual performance, and expenses and cumulative performance.

TABLE XIV

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUND	MULTIPLE COEFFICIENT OF CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Fund	0.8903	0.6533	x		
Commonwealth International Leverage Fund	0.7622	0.6533	x		
Corporate Investors	0.2231	0.6533		x	
Fonds Collectif "A" *	0.8763	0.6929	x		
Investors Mutual	0.9308	0.6533	x		
Savings & Investment Corporation	0.4433	0.6533		x	
Timed Investment Fund	0.2236	0.6533		x	
Fully Managed Funds					
Associate Investors	0.8955	0.6533	x		
Beaubran Corporation	0.3801	0.6533		x	
Canadian Investment Fund	0.9332	0.6533	x		
Dominion Equity Investments	0.5831	0.6533		x	
Grouped Income Shares	0.2842	0.6533		x	
Mutual Accumulating Fund	0.4228	0.6533		x	
Templeton Growth Fund	0.2355	0.6533		x	

*For the Period 1958 to 1966, Inclusive.

For Fourteen Mutual Funds
(i) Mean Multiple Coefficient of Correlation: 0.5774
(ii) Median Multiple Coefficient of Correlation: 0.5132

Null Hypothesis: There is no correlation when total net assets are dependent on expenses and annual performance; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

TABLE XV

FOURTEEN MUTUAL FUNDS

SIGNIFICANCE TESTS FOR MULTIPLE CORRELATION

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	MULTIPLE COEFFICIENT CORRELATION	0.05 LEVEL OF SIGNIFICANCE	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS	RESERVE JUDGMENT
Balanced Funds					
Champion Mutual Funds	0.9528	0.6533	x		
Commonwealth International Leverage Fund	0.9335	0.6533	x		
Corporate Investors	0.9624	0.6533	x		
Fonds Collectif "A" *	0.9865	0.6929	x		
Investors Mutual of Canada	0.9845	0.6533	x		
Savings & Investment Corporation	0.9421	0.6533	x		
Timed Investment Fund	0.9939	0.6533	x		
Fully Managed Funds					
Associate Investors	0.9935	0.6533	x		
Beaubran Corporation	0.9754	0.6533	x		
Canadian Investment Fund	0.9824	0.6533	x		
Dominion Equity Investments	0.9403	0.6533	x		
Grouped Income Shares	0.9631	0.6533	x		
Mutual Accumulating Fund	0.9844	0.6533	x		
Templeton Growth Fund	0.4310	0.6533		x	

* For the Period 1958 to 1966, Inclusive

For Fourteen Mutual Funds:
(i) Mean Multiple Coefficient of Correlation: 0.9304
(ii) Median Multiple Coefficient of Correlation: 0.9693

Null Hypothesis: There is no correlation when total net assets are dependent on expenses and cumulative performance; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq r \leq \frac{1.96}{\sqrt{n-1}}$.

IV COMMISSION CHARGES AND CUMULATIVE PERFORMANCE

Mutual fund shares distributed by sales agents usually have a "loading" or commission charge which is paid by the investor. Inevitably, the question arises as to whether or not the payment of the "loading" charges will be rewarded with superior investment performance.

The null hypothesis of no correlation between the commission charges and cumulative performance (after allowing for the commission charges) for the fourteen mutual funds is accepted at the 0.05 level of significance (Table XVI). There is a weak and inverse relationship between the commission charges and the cumulative performance. The payment of commission charges does not mean that the investor will be rewarded with superior cumulative performance. In addition, the relative amount of the commission charges should not be a criterion for evaluating the management and performance of mutual funds. This conclusion is generally supported by Friend et al who have stated that:

> ... the absence of a relation between sales charges and performance means that the investor is not able to conclude that the existence of a higher sales charge is associated with the existence of superior performance.[2]

Of the fourteen mutual funds, Associate Investors was the only one which did not have a commission charge. It is interesting to note that for the ten year period, Associate Investors ranked fourth with a cumulative performance of 99.80% before allowing for the commission charges in the calculation of the cumulative performances for the other funds. However, it ranked third after allowing for the commission charges in the performance computation for the other funds. Dominion

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[2]Friend, Brown, Herman and Vickers, op. cit., p. 20.

TABLE XVI

FOURTEEN MUTUAL FUNDS

COMMISSION CHARGES AND CUMULATIVE PERFORMANCE ASSUMING REINVESTMENT

OF CASH DISTRIBUTIONS ON LUMP SUM PURCHASES OF $1,000

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	COMMISION CHARGES	CUMULATIVE PERFORMANCE EXCLUDING COMMISSION	CUMULATIVE PERFORMANCE INCLUDING COMMISSION	EFFECT OF COMMISSION ON CUMULATIVE PERFORMANCE
Balanced Funds				
Champion Mutual Fund	$ 90.00 (9%)	65.80%	50.95%	14.85%
Commonwealth International Leverage Fund	87.50 (8 3/4)	105.90	87.94	17.96
Corporate Investors	85.00 (8 1/2)	74.88	60.07	14.81
Fonds Collectif "A"	80.00 (8)	76.09	62.04	14.05
Investors Mutual	80.00 (8)	84.54	69.82	14.72
Savings & Investment Corporation	85.00 (8 1/2)	74.85	60.04	14.81
Timed Investment Fund	90.00 (9)	86.27	69.55	16.72
Fully Managed Funds				
Associate Investors	none	99.80	99.80	nil
Beaubran Corporation	60.50 (6.05)	82.07	71.11	10.96
Canadian Investment Fund	86.67 (8 2/3)	78.97	63.49	15.48
Dominion Equity Investments	15.00 (1 1/2)	107.44	104.39	3.05
Grouped Income Shares	85.00 (8 1/2)	55.75	42.56	13.19
Mutual Accumulating Fund	85.00 (8 1/2)	92.52	76.23	16.29
Templeton Growth Fund	85.00 (8 1/2)	156.08	134.38	21.70

Null Hypothesis: There is no correlation between the commission charges and cumulative performance (after allowing for the commission charges) for the fourteen mutual funds; reject the null hypothesis if $\tau < \frac{-1.96}{\sqrt{n-1}}$ or $\tau > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} \leq \tau \leq \frac{1.96}{\sqrt{n-1}}$.

Test for Rejection: $-0.4537 > -0.5436$

Test for Acceptance: $-0.5436 < -0.4537 < 0.5436$

Result: Accept the Null Hypothesis

Equity Investments, which ranked second with a cumulative performance of 107.44%, excluding commission charges, and 104.39% including commission charges, had the lowest commision charge of 1 1/2%. Templeton Growth Fund, which ranked first with a cumulative performance of 156.08% excluding commission charges, and 134.38% including commission charges, had a commission charge of 8 1/2%.

V SUMMARY

In this chapter, null hypotheses were tested at the 0.05 level of significance to determine the general relevance of such variables as expenses, performance, size, and commission charges in the evaluation of mutual funds.

On the basis of the mean and median partial coefficients of correlation for the fourteen mutual funds, it is apparent that:

(1) There is no relationship between expenses and annual performance, or between expenses and cumulative performance, when the total net assets are held constant.

(2) There is no relationship between expenses and the total net assets, when either the annual or the cumulative performance is held constant.

(3) There is no relationship between the annual performance and the total net assets, when expenses are held constant.

(4) There is a relationship between the cumulative performance and the total net assets, when expenses are held constant.

It is apparent on the basis of the mean and median multiple coefficients of correlation, that:

(1) Expenses are dependent on the annual performance and the total net assets.

(2) Expenses are not dependent on the cumulative performance and the total net assets when the mean coefficient is used, but judgment is reserved on this relationship when the median coefficient is used.

(3) Annual performance is not dependent on expenses and the total net assets.

(4) Cumulative performance is dependent on expenses and the total net assets.

(5) Total net assets are not dependent on expenses and the annual performance.

(6) Total net assets are dependent on expenses and the cumulative performance.

There is no relationship between the commission charges and the cumulative performance (after allowing for the commission charges) for the fourteen mutual funds.

Of the relationships tested in this chapter, the relationship between the cumulative performance and the total net assets is the only one which may be relevant in the evaluation of mutual funds. However, its relevance seems limited to the conclusion that investors will increase their contributions to a mutual fund if its cumulative performance increases. Therefore, it is concluded that none of the tested relationships are relevant in the evaluation of mutual funds.

CHAPTER III

RISK - RETURN AND OBJECTIVES

In this study, risk is defined as the degree of volatility in the cumulative return for each of the fourteen mutual funds over a period of ten years, relative to each other, and relative to the assumed non-chequing savings account which has the least volatile cumulative return. Volatility is measured by the standard deviation of the cumulative return, and also by the slope of the straight line of regression for the cumulative return of each mutual fund and of the savings account. These two separate measures of volatility are based on the cumulative return for each mutual fund, exclusive of any commission charges.

I RISK - RETURN BY STANDARD DEVIATION

The null hypothesis that there is no correlation between the standard deviations and the cumulative returns for the fourteen mutual funds is rejected at the 0.05 level of significance (Tables XVII and XVIII). In fact, the correlation coefficient of +0.9777 indicates a very strong and nearly perfect correlation between these two variables. This result strongly implies that the cumulative return increases when the standard deviation increases, or alternatively, the cumulative return increases when the risk increases. There are reasonable limits to this conclusion which would preclude the acceptance and tolerance of risk levels which are not rational in terms of probabilistic returns. Given the definition of risk used in this study, the standard deviations of the cumulative returns for the fourteen mutual funds are reasonable measures of the risk exposures in relation to the returns, as evidenced by the highly positive

TABLE XVII

FOURTEEN MUTUAL FUNDS

RISK AND CUMULATIVE RETURN

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	STANDARD DEVIATION	CUMULATIVE RETURN	RISK FACTOR*	RANK		
				STD. DEV.	PERF.	EFFICIENCY**
Balanced Funds						
Champion Mutual	29.5691	65.80%	2.2252	13	13	13
Commonwealth International Leverage Fund	42.9781	105.90	2.4640	3	3	6
Corporate Investors	30.8450	74.88	2.4276	11	11	9
Fonds Collectif "A"	31.0591	76.09	2.4498	10	10	7
Investors Mutual	32.2993	84.54	2.6173	9	7	2
Savings & Investment Corporation	30.7447	74.85	2.4345	12	12	8
Timed Investment Fund	33.9629	86.27	2.5401	8	6	3
Mean	33.0640	81.19	2.4512	9.4	8.9	6.9
Median	31.6792	80.32	2.4569	10.5	10.5	7.5
Fully Managed Funds						
Associate Investors	41.8424	99.80	2.3851	4	4	10
Beaubran Corporation	35.2717	82.07	2.3267	6	8	11
Canadian Investment Fund	34.1295	78.97	2.3138	7	9	12
Dominion Equity Investments	43.4510	107.44	2.4726	2	2	5
Grouped Income Shares	28.0852	55.75	1.9850	14	14	14
Mutual Accumulating Fund	36.9642	92.52	2.5029	5	5	4
Templeton Growth Fund	55.2615	156.08	2.8243	1	1	1
Mean	39.2864	96.09	2.4015	5.6	6.1	8.1
Median	39.4043	96.16	2.4289	5.5	6.5	10.5

* Cumulative Return ÷ Standard Deviation

**Same as the Risk Factor - Relative Measure of the Risk Efficiency

TABLE XVIII

FOURTEEN MUTUAL FUNDS

RISK AND CUMULATIVE RETURN

FOR THE PERIOD 1957 to 1966, INCLUSIVE

Null Hypothesis:	There is no correlation between the standard deviations and the cumulative returns for the fourteen mutual funds; reject the null hypothesis of no correlation if $r < \frac{-1.96}{\sqrt{n-1}}$ or $r > \frac{1.96}{\sqrt{n-1}}$; reserve judgment (or accept the null hypothesis) if $\frac{-1.96}{\sqrt{n-1}} < r < \frac{1.96}{\sqrt{n-1}}$ (0.05 level of significance).
Zero Order Coefficient of Correlation:	+0.9777
Test for Rejection:	$r > 1.96$; $+0.9777 > +0.5436$
Result:	Reject the null hypothesis

coefficient of correlation.

The risk for the seven fully managed funds, as measured by the median standard deviation, is about 24.4% greater than for the seven balanced funds, while the corresponding median cumulative return is about 19.7% greater (Table XVII). However, the median risk factor for the fully managed funds is about 1.1% less than for the balanced funds. This result suggests that while the fully managed funds have a greater risk exposure, the risk in relation to the return is slightly more efficient than for the balanced funds. In other words, even though the level or the degree of risk exposure is lower for the balanced funds, the return relative to its risk level is slightly lower than for the fully managed funds. Given the difference in the degree of risk, the fully managed funds are slightly more efficient than the balanced funds in the utilization of risk.

II RISK - RETURN BY REGRESSION LINE

The second method for measuring risk is based on the slope of the straight line of regression for the cumulative return of each mutual fund and of the assumed non-chequing savings account with the Federal Government. With this method, it is possible to calculate the expected cumulative return for each of the mutual funds on the basis of their respective risk exposures. The actual return is compared with the expected return in order to assess the risk-return efficiency for each mutual fund.

For the fourteen mutual funds, the risk-return efficiencies range between 65.14% for Grouped Income Shares to 89.02% for Templeton Growth Fund (Table XIX). Therefore, the former fund is the least efficient,

while the latter fund is the most efficient. It is notable that the actual cumulative returns of the mutual funds are less than their expected cumulative returns. This may suggest that risk and return are not commensurable and that there is a point of diminishing returns.

The risk for the fully managed funds, as measured by the median slope of the straight line of regression, is about 24.4% greater than for the balanced funds, while the corresponding median cumulative performance is about 19.7% greater (Table XIX). However, the median risk-return efficiency for the balanced funds is slightly higher than for the fully managed funds. Given the difference in the degree of risk, the balanced funds are slightly more efficient than the fully managed funds in the utilization of risk.

III RISK - RETURN BY STANDARD DEVIATION AND BY REGRESSION LINE

When comparing the two methods for measuring risk and return, the risk for the fully managed funds is about 24.4% greater than for the balanced funds, while the corresponding cumulative return is about 19.7% greater, regardless of the method used. Using the standard deviation method, it is concluded that the fully managed funds are slightly more efficient than the balanced funds in the utilization of risk, while the reverse is concluded when using the regression line method.

There is some discrepancy in the results when the fourteen mutual funds are ranked and compared in terms of their risk-return efficiencies as measured by both methods (Table XX). Of the fourteen funds, nine of them have identical rankings from 1 to 3 inclusive, and from 9 to 14, inclusive. Consequently, there is agreement on the three most efficient funds and on the six least efficient funds. For the remaining five funds,

TABLE XIX

FOURTEEN MUTUAL FUNDS

RISK AND CUMULATIVE RETURN

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	SLOPE OF STRAIGHT LINE OF REGRESSION*	ACTUAL CUMULATIVE PERFORMANCE	EXPECTED CUMULATIVE PERFORMANCE**	RISK-RETURN EFFICIENCY	RISK-RETURN RANKING
Assumed Non-Chequing Savings Account	1.0000	64.77%	64.77%	100.00%	—
Balanced Funds					
Champion Mutual Fund	1.4279	65.80%	92.49%	71.14%	13
Commonwealth International Leverage Fund	2.0750	105.90	134.40	78.79	4
Corporate Investors	1.5213	74.88	98.53	76.00	9
Fonds Collectif "A"	1.5278	76.09	98.96	76.89	6
Investors Mutual Fund	1.6049	84.54	103.95	81.33	2
Savings & Investment Corporation	1.5128	74.85	97.98	76.39	7
Timed Investment Fund	1.6454	86.27	106.57	80.59	3
Mean	1.6164	81.19	113.95	77.30	6.3
Median	1.5664	80.32	101.46	77.84	6.5
Fully Managed Funds					
Associate Investors	2.0447	99.80	132.44	75.35	10
Beaubran Corporation	1.7449	82.07	113.02	72.62	11
Canadian Investment Fund	1.6810	78.97	108.88	72.53	12
Dominion Equity Investments	2.1759	107.44	140.93	76.24	8
Grouped Income Shares	1.3215	55.75	85.59	65.14	14
Mutual Accumulating Fund	1.8515	92.52	119.92	77.15	5
Templeton Growth	2.7071	156.08	175.33	89.02	1
Mean	1.9324	96.09	125.16	75.29	8.7
Median	1.9481	96.16	126.18	75.80	10.5

* For the cumulative performance of each mutual fund and of the assumed non-chequing savings account with the Federal Government.

** (Slope of straight line of regression) x (0.6477)

the most serious discrepancy between the two methods is for Dominion Equity Investments which is ranked 5 and 8 on the basis of the standard deviation method and the regression line method, respectively. Dominion Equity has the second highest standard deviation or risk and the second highest cumulative return. However, relative to some of the other mutual funds, Dominion Equity accepted a higher risk level than necessary to achieve its return, or alternatively, the return should have been greater in relation to the actual risk exposure. Consequently, the rank of 5 is relative to the risk exposure and the cumulative return for the other mutual funds.

As pointed out, Dominion Equity has a lower rank on the basis of the regression line method. This rank is not relative to the risk and return for the other mutual funds as in the standard deviation method because the actual cumulative return for each fund is expressed as a percentage of its expected cumulative return on the basis of the actual risk exposure as indicated by the slope of the regression line. The percentage indicates the risk-return efficiency for each fund and the funds are ranked on the basis of their efficiencies. Consequently the discrepancy in the rankings from 4 to 8, inclusive, may be attributable in part to the difference in the two methods. This discrepancy may also be attributable to the cyclical nature of the ten year period used in this study. In the years 1957 and 1966, the major stock market indices and the performance of most mutual funds had declined significantly on a relative basis in each of those years. The measurements of risk and return over this period probably have a cyclical bias. Those mutual funds with the best and the worst risk-return efficiences may have a strong cyclical bias, whereas the other funds may have relatively little

TABLE XX

FOURTEEN MUTUAL FUNDS

RISK-RETURN EFFICIENCIES

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	RANKING STRAIGHT LINE OF REGRESSION	RANKING STANDARD DEVIATION RISK FACTOR	RANKING ACTUAL CUMULATIVE PERFORMANCE	TYPE OF FUND FULLY MANAGED (F) OR BALANCED (B)
Templeton Growth Fund	1	1	1	F
Investors Mutual Fund	2	2	7	B
Timed Investment Fund	3	3	6	B
Commonwealth International Leverage	4	6	3	B
Mutual Accumulating Fund	5	4	5	F
Fonds Collectif "A"	6	7	10	B
Savings & Investment Corporation	7	8	12	B
Dominion Equity Investments	8	5	2	F
Corporate Investors	9	9	11	B
Associate Investors	10	10	4	F
Beaubran Corporation	11	11	8	F
Canadian Investment Fund	12	12	9	F
Champion Mutual Fund	13	13	13	B
Grouped Income Shares	14	14	14	F

or no bias. This may explain why both methods result in identical rankings for these funds which are either the most or the least efficient, but result in different rankings for the remaining funds. Under the circumstances, it is not certain whether the balanced funds or the fully managed funds are more efficient in the utilization of risk.

IV OBJECTIVES

An examination of the promulgated objectives for the fourteen mutual funds results in the subjective conclusion that these objectives generally describe an approach to investing funds, which presumably rests on some underlying investment philosophy or belief which may be implied, but not clearly defined (Tables XXI and XXII). The promulgated objectives might be better classified as policies which describe the intended course of action required to fulfill the actual and unknown objectives. Consequently, if a fund is described as a balanced fund or a fully managed fund, it is only a description of policy and not of objectives. Ideally, the objectives should state the investment philosophy rationalized in terms of risk and return; the expected future return and the related risk level should be specified over a given time span. From a practical point of view, risk-return levels are presently difficult to quantify in a meaningful way and the problem becomes relatively more complicated in the prediction of the future risk-return levels.

The median risk-return efficiences for the balanced funds and the fully managed funds are 77.84% and 75.80%, respectively (Table XIX). On this basis, it appears that both types of funds have been reasonably successful in achieving their objectives.

TABLE XXI

OBJECTIVES OF BALANCED MUTUAL FUNDS

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	OBJECTIVES
Champion Mutual Fund	Operates as a balanced mutual investment fund, investing primarily in common, preferred stocks and bonds of various types of industries, utilities and other corporations.
Commonwealth International Leverage Fund	Operates as an investment fund with a principal objective of capital growth with income as a secondary objective.
Corporate Investors	A balanced mutual investment fund with the primary objective of growth of capital and assurance of income return.
Fonds Collectif "A"	Operates as a balanced mutual fund.
Investors Mutual	Operates as a balanced mutual fund investing primarily in Canadian securities. Principal objectives are to provide a reasonable return on investments made and long-term growth of capital, and to protect the value of the shareholders' investment.
Savings and Investment Corporation	Operates as a balanced mutual investment fund. Its main objective is to provide a reasonable return combined with long-term growth of capital.
Timed Investment Fund	A balanced mutual fund investing in bonds, preferred stocks and common stocks in direct ratio to market indices; when market index is low the fund invests mostly in common stocks, when high, in bonds and preferred stocks. The prime purpose is capital gain plus a good return on the investment.

Source: Financial Post Survey of Investment Funds.

TABLE XXII

OBJECTIVES OF FULLY MANAGED MUTUAL FUNDS

FOR THE PERIOD 1957 to 1966, INCLUSIVE

FUNDS	OBJECTIVES
Associate Investors	Operates as a fully-managed investment fund. Principal objective is long-term growth of capital and assurance of income.
Beaubran Corporation	Fully-managed fund with the policy of providing a convenient medium for diversified investment by investing in Canadian bonds, preferred shares, and common shares.
Canadian Investment Fund	Policy of giving major consideration to relatively high and stable income through broadly diversified investment, primarily in dividend-paying common stocks with due regard for protection of the shareholders' capital and opportunities for appreciation.
Dominion Equity Investments	Operates as a fully managed balanced mutual fund, investing mainly in Canadian preferred and common stocks to produce revenue and capital growth.
Grouped Income Shares	Operates as a fully managed mutual fund. Policy is to invest principally in a select list of Canadian and American common stocks which are considered to be of high quality with better than average growth potentialities over a long term.
Mutual Accumulating Fund	Operates as an open-end compound-cumulative management investment fund. Its fully-managed investment policy is aimed at maximum long term growth of capital (and income for reinvestment) consistent with prudent diversification.
Templeton Growth Fund	Operates as a fully-managed fund investing principally in preferred and common stocks of Canadian companies. Its objective is long-term growth of capital.

Source: Financial Post Survey of Investment Funds.

V SUMMARY

It is not certain whether the balanced funds or the fully managed funds are more efficient in the utilization of risk when using the standard deviation and regression line methods. Mutual funds should be evaluated in terms of their risk-return efficiencies, rather than their records of cumulative performance which emphasizes return only.

The promulgated objectives of the fourteen mutual funds generally describe an approach to investing funds based on some underlying investment philosophy. The approach of the fully managed funds implies that the real objective is to accept a higher level of risk exposure and return relative to that for the balanced funds. While the investor in mutual funds has to decide on the level of his risk tolerance, it is also necessary for him to select the mutual fund which has the highest risk-return efficiency. Before assuming that the present level of efficiency for a mutual fund will be maintained or increased in the future, it is necessary to review its portfolio over a period of five to ten years so that the actual diversification policies can be ascertained. To be meaningful, these policies should be compared with those policies for other similar mutual funds. An evaluation of the portfolios of the fourteen mutual funds is beyond the scope of this study.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study focuses on expenses, performance, size, commission charges, risk-return, and objectives, on the premise that some factors are more important than others in the evaluation of mutual funds. The relative importance of these factors is determined by testing null hypotheses based on an objective sample of fourteen balanced and fully managed funds covering the period 1957 to 1966, inclusive.

In Chapter II, the significance of each of the factors of expenses, performance, size, and commission charges is tested at the 0.05 level of significance. For expenses, the results of the correlation analysis are as follows:

(1) Expenses are dependent on the annual performance and the total net assets.

(2) Expenses are not dependent on the cumulative performance and the total net assets when the mean coefficient of correlation is used, but judgment is reserved on this relationship when the median coefficient of correlation is used.

With respect to (1), management fees are a specified percentage of the annual or average annual market value of the portfolio for the mutual funds. These fees, which represent a significant portion of the total expenses, will increase when the annual performance and/or the total net assets increase.

There is a relationship between the cumulative performance and the total net assets at the 0.05 level of significance. Total net

assets will increase in response to increases in the cumulative performance. It is very likely that the increase in total net assets is largely attributable to new and additional contributions by investors, rather than to increases in the net realized and unrealized capital appreciation on investments.

At the 0.05 level of significance, there is no relationship between the commission charges and the cumulative performance (after allowing for commission charges). Therefore, the payment of commission charges is no guarantee that the investor will be rewarded with superior performance.

In Chapter III, the factors of risk, return, and objectives are considered. The question of whether the balanced funds or the fully managed funds are more efficient in the utilization of risk has not been resolved in this study.

It is argued that the promulgated objectives of the mutual funds generally describe an approach to investing funds which may be implied, but not clearly defined. Consequently, these objectives might be better classified as policies which describe the intended course of action required to fulfill the actual and unknown objectives. On the basis of the risk-return efficiencies, it appears that the balanced funds and the fully managed funds have been reasonably successful in achieving their objectives.

Of the factors considered, the thesis of this study is that the risk-return efficiency is one of the most important and relevant factors in the evaluation of mutual funds.

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APPENDIX A

FOURTEEN MUTUAL FUNDS

INVESTMENT ADVISERS OR COUNSELLORS

FUNDS	DATE OF COMMENCEMENT OF OPERATIONS	ADVISERS OR COUNSELLORS
Balanced Funds		
Champion Mutual Fund	October 27, 1955	Champion Savings Corporation Ltd.
Commonwealth International Leverage Fund	January, 1950	Canadian Channing Corporation. (a)
Corporate Investors	June 1, 1932	Loomis, Sayles (Canada) Ltd. (a)
Fonds Collectif "A"	January 21, 1957	Les Placements Collectifs Inc. (a)
Investors Mutual	January 3, 1950	The Investors Group (a)
Savings and Investment Corporation	February, 1957	Savings and Investment Group
Timed Investment Fund	July 17, 1950	Timed Investors Ltd. (a)
Fully Managed Funds		
Associate Investors	October 31, 1950 (b)	Leon Frazer & Associates. (a)
Beaubran Corporation	July 3, 1947 (b)	Bolton, Tremblay & Co.
Canadian Investment Fund	December 5, 1932	Calvin Bullock, Ltd. (c)
Dominion Equity Investments	June 12, 1951	Investment Secretariat Ltd. (a) Lepercq, de Neuflize & Co.
Grouped Income Shares	April, 1952 (d)	Grouped Fund Distributors Ltd. (a)
Mutual Accumulating Fund	January, 1950	Mutual Funds Management Corp. Ltd. (a)
Templeton Group Fund	November 29, 1954 (e)	Templeton Management Ltd. (a)

(a) Investment Manager
(b) Date of inception
(c) Investment supervisor
(d) This fund succeeds Grouped Income Shares, Series "A", a 20-year-term unit investment trust, established in 1932, which completed its term of service in 1951.
(e) Name changed from Templeton Group Fund of Canada, Ltd. to Axe-Templeton Group Fund of Canada, Ltd. on August 30, 1957 and back to the original name on July 3, 1963, following withdrawal of the Axe Organization from the Management and to the present name on July 2, 1964.

Source: Financial Post Survey of Investment Funds

APPENDIX B

FOURTEEN MUTUAL FUNDS

FEES FOR MANAGEMENT, REINVESTMENT OF DIVIDENDS, AND REDEMPTIONS

	ANNUAL MANAGEMENT FEES						FEES FOR RE-INVESTMENT OF DIVIDENDS			FEES FOR REDEMPTION		
FUNDS	0.30%	0.33%	0.40%	0.50%	0.60%	0.75%	No Fee	Not Indicated	Other	No Fee	Not Indicated	Other
Balanced Funds												
Champion Mutual Fund				x(a)			x				x	
Commonwealth International Leverage Fund						x(a)(e)	x				x	
Corporate Investors				x(b)					x(g)		x	
Fonds Collectif "A"						x(a)		x			x	
Investors Mutual				x(b)				x			x	
Savings & Investment Corporation				x(b)				x			x	
Timed Investment Fund			x(a)					x			x	
Fully Managed Funds												
Associate Investors						x(b)(c)		x				1%(h)
Beaubran Corporation (d)								x				1%(h)
Canadian Investment Fund		x(b)						x			x	
Dominion Equity Investments					x(f)			x				1%(h)
Grouped Income Shares				x(b)				x			x	
Mutual Accumulating Fund			x(b)						x(i)		x	
Templeton Growth Fund				x(b)				x			x	

(a) Charged monthly.
(b) Charged quarterly.
(c) Includes unspecified director's fees.
(d) Management fee rate is not specified.
(e) Estimate - fees are charged on the total assets of two separate funds and then prorated to each fund.
(f) Estimated on the basis of management and advisory fees paid in relation to total net assets.
(g) No charge if shareholds hold fifty shares or more.
(h) Of the liquidating value.
(i) Does not pay dividends.

Source: Financial Post Survey of Investment Funds

APPENDIX C (1)

FOURTEEN MUTUAL FUNDS

COMMISSION CHARGES ON LUMP SUM PURCHASES

FUNDS	Less Than $3,000	Less Than $5,000	$5,000 $9,999	$10,000 $14,999	$15,000 $19,000	$20,000 $24,999
Balanced Funds						
Champion Mutual Fund	9%	9%	9%	9%	9%	9%
Commonwealth International Leverage Fund	8 3/4	8 3/4	8 1/2	8 1/2	7 1/2	7 1/2
Corporate Investors	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2
Fonds Collectif "A"	8	7 1/2	7 1/2	7	7	7
Investors Mutual	8	8	7 1/2	7 1/2	7	6 1/2
Savings and Investment Corporation	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2
Timed Investment Fund	Maximum of 9% of the offering price					
Fully Managed Funds						
Associate Investors	No commission or loading charge					
Beaubran Corporation	6.05% of the offering price					
Canadian Investment Fund	8 2/3%	8 2/3%	8 2/3%	8 2/3%	8 2/3%	8 2/3%
Dominion Equity Investments	1 1/2% of the net asset value					
Grouped Income Shares	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2
Mutual Accumulating Fund	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2
Templeton Growth Fund	8 1/2	8 1/2	8 1/2	7 1/2	7 1/2	7 1/2

Source: Financial Post 1962 Survey of Investment Funds

APPENDIX C (2)

FOURTEEN MUTUAL FUNDS

COMMISSION CHARGES ON LUMP SUM PURCHASES

FUNDS	$25,000 $49,999	$50,000 $99,999	$100,000 $199,999	$200,000 $299,999	$300,000 $399,000	$400,000 $499,999
Balanced Funds						
Champion Mutual Fund	7 1/2 %	4 1/2%	4%	3%	3%	2 1/2%
Commonwealth International Leverage Fund	6 1/2-5	4 1/2-4	3 1/2	3	3	2 1/2
Corporate Investors	7 1/2	5 1/2	4	4-2 1/2	2 1/2	2 1/2
Fonds Collectif "A"	6	5	4	4-3	3	3
Investors Mutual	6	5-4 1/2	3 1/2	3 1/2	3 1/2	3 1/2
Savings and Investment Corporation	7 1/2-6 1/2	4 1/2-4	3 1/2	3	3	2 1/2
Timed Investment Fund	Maximum of 9% of the offering price					
Fully Managed Funds						
Associate Investors	No commission or loading charge					
Beaubran Corporation	6.05% of the offering price					
Canadian Investment Fund	8 2/3%	5 1/2%	4%	4%	4	4%
Dominion Equity Investments	1 1/2% of the net asset value					
Grouped Income Shares	7 1/2	5 1/2	4	4-2 1/2	2 1/2	2 1/2
Mutual Accumulating Fund	7 1/2	5 1/2	4	4-2 1/2	2 1/2	2 1/2
Templeton Growth Fund	6	4	3	3-2	2	2

Source: Financial Post 1962 Survey of Investment Funds

APPENDIX C (3)

FOURTEEN MUTUAL FUNDS

COMMISSION CHARGES ON LUMP SUM PURCHASES

FUNDS	$500,000 $599,999	$600,000 $699,999	$700,000 $799,999	$800,000 $899,999	$900,000 $999,999	$1,000,000 and over
Balanced Funds						
Champion Mutual Fund	2 1/2%	2 1/2%	2%	2%	2%	1 1/2%
Commonwealth International Leverage Fund	2 1/2	2	2	1 1/2	1 1/2	1
Corporate Investors	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Fonds Collectif "A"	2	2	2	2	2	1 1/2
Investors Mutual	3	3	3	3	3	3
Savings and Investment Corporation	2 1/2	2 1/2	2	2	2	1 1/2
Timed Investment Fund	Maximum of 9% of the offering price					
Fully Managed Funds						
Associate Investors	No commission or loading charge					
Beaubran Corporation	6.05% of the offering price					
Canadian Investment Fund	4%	4%	4%	4%	4%	4%
Dominion Equity Investments	1 1/2% of the net asset value					
Grouped Income Shares	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Mutual Accumulating Fund	1	1	1	1	1	1
Templeton Growth Fund	1	1	1	1	1	1

Source: Financial Post 1962 Survey of Investment Funds

APPENDIX D

FOURTEEN MUTUAL FUNDS

NET ASSET VALUE AND DIVIDENDS PER SHARE

FOR THE PERIOD 1957 to 1966, INCLUSIVE

	1957		1958		1959		1960		1961		1962		1963		1964		1965		1966	
FUNDS	N.A.V. *	C.D.**	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.	N.A.V.	C.D.
Balanced Funds																				
Champion Mutual Fund	$4.47	$4.67	$5.45	$5.65	$5.41	$5.62	$5.37	$5.53	$6.27	$6.45	$5.62	$5.78	$6.25	$6.41	$7.21	$7.39	$7.44	$7.62	$6.46	$6.64
Commonwealth International Leverage Fund	4.14	4.36	6.24	6.42	6.69	6.83	6.62	6.77	8.32	8.48	7.12	7.28	7.95	8.11	9.29	9.46	10.08	10.25	8.94	9.10
Corporate Investors	3.64	3.80	4.51	4.67	4.45	4.62	4.48	4.64	5.24	5.40	4.98	5.14	5.35	5.53	5.90	6.09	5.81	6.01	5.29	5.49
Fonds Collectif "A"	4.80	4.91	5.33	5.50	5.31	5.48	5.28	5.46	6.41	6.58	6.08	6.26	6.61	6.81	7.37	7.58	7.25	7.49	6.48	6.76
Investors Mutual	2.98	3.08	3.71	3.81	3.74	3.85	3.79	3.91	4.45	4.57	4.08	4.20	4.40	4.53	4.94	5.07	5.09	5.23	4.67	4.81
Savings & Investment Corporation	4.66	4.74	5.37	5.54	5.23	5.42	5.15	5.33	6.35	6.55	5.93	6.02	6.40	6.60	7.24	7.45	7.28	7.50	6.55	6.79
Timed Investment Fund	4.45	4.67	5.75	5.97	5.50	5.74	5.55	5.81	6.40	6.66	6.15	6.41	6.35	6.61	7.09	7.37	6.95	7.24	6.04	6.34
Fully Managed Funds																				
Associate Investors	$3.27	$3.43	$4.04	$4.20	$4.20	$4.36	$3.81	$3.98	$4.61	$4.78	$4.38	$4.56	$4.86	$5.04	$5.82	$6.00	$5.89	$6.08	$5.06	$5.28
Beaubran Corporation	25.52	26.62	29 64	30.74	28.75	29.85	28.79	29.99	34.32	35 .52	32.41	33.61	35.42	36.62	41.41	42.70	41.50	42.90	36.83	38.33
Canadian Investment Fund	2.59	2.71	3.08	3.19	3.02	3.14	2.95	3.07	3.59	3.72	3.37	3.50	3.65	3.78	4.18	4.32	4.17	4.32	3.69	3.84
Dominion Equity Investments	3.15	3.27	3.75	3.88	3.79	3.92	3.81	3.94	4.66	4.80	4.51	4.65	5.05	5.19	5.82	5.96	6.01	6.16	5.45	5.60
Grouped Income Shares	3.06	3.26	3.82	4.02	3.81	4.04	3.35	3.55	3.82	4.02	3.40	3.59	3.78	3.98	4.18	4.40	4.27	4.50	3.47	3.68
Mutual Accumulating Fund	2.27	2.27	2.85	2.85	2.97	2.97	3.00	3.00	3.74	3.74	3.50	3.50	4.08	4.08	4.85	4.85	5.19	5.19	4.97	4.97
Templeton Growth Fund	4.71	4.71	7.02	7.02	8.03	8.03	9.17	9.17	10.80	10.80	9.34	9.34	9.82	9.82	12.47	12.61	15.02	15.21	14.05	14.24

*Net asset value per share.

**Cum dividends to the lowest near cent.

Source: Financial Post Survey of Investment Funds

APPENDIX E (1)

BALANCED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

UNDS	SELL SHORT	BUY ON MARGIN	SECURITIES NOT FULLY PAID	COMMODITIES	MORTGAGES	REAL ESTATE	LOANS	MAXIMUM % OF TOTAL IN ONE CORP. (a)
hampion Mutual Fund	No	No	No	-	-	-	-	10%
ommonwealth International Leverage Fund	No	No	No	No	No	-	-	5
orporate Investors	No	No	No	-	-	-	No	10 (b)
onds Collectif "A"	No	No	-	-	-	No	-	10
nvestors Mutual	No	No	No	-	-	-	-	10
avings & Investment Corporation	No	No	No	-	-	-	-	10
imed Investment Fund	No	No	-	No	-	No	No	10 (c)

a) Excepting government securities

b) Of shares only

c) In one security

ource: Financial Post Survey of Investment Funds

APPENDIX E (2)

BALANCED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

FUNDS	MAXIMUM % OF VOTING STOCK IN ONE COMPANY	MAXIMUM % OF TOTAL IN ONE INDUSTRY (a)	OTHER MUTUAL FUNDS	INITIAL OFFERINGS	UNDERWRITING OR DISTRIBUTION OF OTHER SECURITIES
Champion Mutual Fund	-	-	-	-	-
Commonwealth International Leverage Fund	10%	25%	under certain conditions	under certain conditions	No
Corporate Investors	-	20	No	-	-
Fonds Collectif "A"	-	-	-	-	-
Investors Mutual	-	-	-	-	-
Savings & Investment Corporation	10	-	-	under certain conditions	-
Timed Investment Fund	10	25	No	under certain conditions	-

(a) Excepting government securities

Source: Financial Post Survey of Investment Funds

APPENDIX E (3)

BALANCED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

FUNDS	BORROWING POWERS AS % OF TOTAL ASSETS	OTHER
Champion Mutual Fund	5%	Not more than 40% may be invested in securities not registered under the Canadian and British Insurance Companies Act.
Commonwealth International Leverage Fund	-	
Corporate Investors	5	Not less than 85% of the assets must be invested in government, municipal or corporation bonds, or in securities legal for investment by Canadian insurance companies in Canada, or in securities of corporations which have been in existence for five years and have paid dividends on common stocks for at least three years.
Fonds Collectif "A"	No	Not more than 10% of the net assets may be invested in shares of companies which have not paid a regular dividend for the last three years and which are not listed on the Montreal, Canadian and Toronto stock exchanges, except for shares of banks, trust companies and insurance companies traded over-the counter.
Investors Mutual	5	May not have more than 50% of the gross assets invested in securities which are not authorized for investment under the Canadian and British Insurance Companies Act.
Savings & Investment Corporation	5	
Timed Investment Fund	5	

Source: Financial Post Survey of Investment Funds

APPENDIX F (1)

FULLY MANAGED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

FUNDS	SELL SHORT	BUY ON MARGIN	FULLY PAID	COMMODITIES	MORTGAGES	REAL ESTATE
Associate Investors	No	No	-	-	-	-
Beaubran Corporation	No	No	-	-	-	-
Canadian Investment Fund	No	No	-	-	-	-
Dominion Equity Investments	No	No	-	-	-	-
Grouped Income Shares	No	No	No	-	-	-
Mutual Accumulating Fund	No	No	-	-	-	No
Templeton Growth Fund	No	No	-	No	-	No

Source: Financial Post Survey of Investment Funds

APPENDIX F (2)

FULLY MANAGED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

FUNDS	LOANS	MAX. % OF TOTAL IN ONE CORP.(a)	MAX. % OF VOTING STOCK IN ONE COMPANY	MAX. % OF TOTAL IN ONE INDUSTRY(a)	OTHER MUTUAL FUNDS	INITIAL OFFERINGS
Associate Investors	-	5%(c)	-	-	-	-
Beaubran Corporation	-	-	-	-	-	-
Canadian Investment Fund	-	5%	-	-	-	-
Dominion Equity Investments	-	-	-	-	-	-
Grouped Income Shares	under certain conditions	10%	-	-	No	-
Mutual Accumulating Fund	-	5%(b)	10%	-	-	-
Templeton Growth Fund	No	See other	-	-	-	-

(a) Excepting government securities
(b) Of shares only
(c) In other security

Source: Financial Post Survey of Investment Funds

APPENDIX F (3)

FULLY MANAGED MUTUAL FUNDS

PRINCIPAL INVESTMENT RESTRICTIONS

FUNDS	UNDERWRITING OR DISTRIBUTION OF OTHER SECURITIES	BORROWING POWERS AS % OF TOTAL ASSETS	OTHER
Associate Investors	-	No restrictions	Not more than 20% of the assets may be invested in securities not listed on a recognized stock exchange, other than government securities.
Beaubran Corporation	-	-	
Canadian Investment Fund	-	No	
Dominion Equity Investments	-	No	Up to 5% of net assets may be invested in securities which, in the opinion of the directors, have a reasonable chance of becoming marketable.
Grouped Income Shares	-	No	More than 10% shall not be invested in securities which have a record of less than three years' continuous operation except in cases of issue of rights, recapitalizations, etc.
Mutual Accumulating Fund	-	No	
Templeton Growth Fund	No	under certain conditions	Not more than 5% of the assets may be invested in securities of companies which have been in existence less than 3 years. With respect to 75% of the assets, the fund may not invest more than 5% of gross assets in securities of any one company or purchase more than 10% of any class of securities of any one company.

Source: Financial Post Survey of Investment Funds.